

CLAIMS

What is claimed is:

1. A method of treating a patient with a movement disorder, comprising:
providing at least one miniature leadless stimulator for controlling delivery of at least one stimulus via at least one infusion outlet, wherein the at least one stimulus comprises stimulation via at least one drug delivered through the at least one outlet;
implanting the at least one stimulator entirely or substantially in the carotid sheath; and
using the stimulator, applying the at least one stimulus to at least one vagus nerve in order to at least in part alleviate the movement disorder of the patient being treated.
2. The method of claim 1 wherein the stimulator further includes at least two electrodes, and wherein the stimulus further comprises electrical stimulation delivered via the at least two electrodes.
3. The method of claim 2 wherein the electrical stimulation is delivered at a frequency less than about 100 Hz.
4. The method of claim 1 wherein the stimulation increases activity of the at least one vagus nerve.
5. The method of claim 4 wherein the stimulation is drug stimulation provided by at least a neural depolarizing agent.
6. The method of claim 5 wherein the neural depolarizing agent is succinylcholine.

7. The method of claim 4 wherein the stimulation is drug stimulation provided by at least one of an excitatory neurotransmitter, an excitatory neurotransmitter agonist, an inhibitory neurotransmitter antagonist, an agent that increases the level of an excitatory neurotransmitter, and an agent that decreases the level of an inhibitory neurotransmitter.

8. The method of claim 7 wherein the drug is at least one of acetylcholine and bethanechol.

9. The method of claim 1 further comprising sensing at least one condition and using the at least one sensed condition to automatically determine the stimulus to apply.

10. The method of claim 9 wherein the at least one sensed condition is one or more of acceleration, electromyographic activity, electrical activity of a neural population, a neurotransmitter level, change in a neurotransmitter level, a neurotransmitter breakdown product level, change in a neurotransmitter breakdown product level, a medication level, change in a medication level, a drug level, change in a drug level, a hormone level, change in a hormone level, an enzyme level, change in an enzyme level, an interleukin level, change in an interleukin level, a cytokine level, change in a cytokine level, a lymphokine level, change in a lymphokine level, a chemokine level, change in a chemokine level, a growth factor level, change in a growth factor level, level of a bloodborne substance, change in level of a bloodborne substance, level of a substance in the interstitial fluid, change in level of a substance in the interstitial fluid, a substance in the cerebrospinal fluid, and change in the level of a substance in the cerebrospinal fluid.

11. A method of treating a patient with a movement disorder, comprising:
providing at least one system control unit that generates stimulating pulses in accordance with prescribed parameters, which stimulating pulses are infusion pulses;
providing at least one catheter connected to the at least one system control unit, which catheter includes at least one discharge portion;
implanting the at least one catheter discharge portion adjacent to at least one vagus nerve to be stimulated;
implanting the at least one system control unit at a location remote from the at least one tissue to be stimulated;
tunneling the catheter subcutaneously to the system control unit location; and
delivering via the infusion pulses at least one drug to the at least one vagus nerve, thereby affecting a movement disorder in order to at least in part alleviate the movement disorder of the patient being treated.

12. The method of claim 11 wherein the system control unit is further connected to at least one electrode, and wherein the stimulus further comprises electrical stimulation delivered via the at least one electrode.

13. The method of claim 12 wherein the electrical stimulation is delivered at a frequency less than about 100 Hz.

14. The method of claim 11 wherein the stimulation increases activity of the at least one vagus nerve.

15. The method of claim 14 wherein the stimulation is drug stimulation provided by at least a neural depolarizing agent.

16. The method of claim 15 wherein the neural depolarizing agent is succinylcholine.

17. The method of claim 14 wherein the stimulation is drug stimulation provided by at least one of an excitatory neurotransmitter, an excitatory neurotransmitter agonist, an inhibitory neurotransmitter antagonist, an agent that increases the level of an excitatory neurotransmitter, and an agent that decreases the level of an inhibitory neurotransmitter.

18. The method of claim 17 wherein the drug is at least one of acetylcholine and bethanechol.

19. The method of claim 11 further comprising sensing at least one condition and using the at least one sensed condition to automatically determine the stimulus to apply.

20. The method of claim 19 wherein the at least one sensed condition is one or more of acceleration, electromyographic activity, electrical activity of a neural population, a neurotransmitter level, change in a neurotransmitter level, a neurotransmitter breakdown product level, change in a neurotransmitter breakdown product level, a medication level, change in a medication level, a drug level, change in a drug level, a hormone level, change in a hormone level, an enzyme level, change in an enzyme level, an interleukin level, change in an interleukin level, a cytokine level, change in a cytokine level, a lymphokine level, change in a lymphokine level, a chemokine level, change in a chemokine level, a growth factor level, change in a growth factor level, level of a bloodborne substance, change in level of a bloodborne substance, level of a substance in the interstitial fluid, change in level of a substance in the interstitial fluid, a substance in the cerebrospinal fluid, and change in the level of a substance in the cerebrospinal fluid.